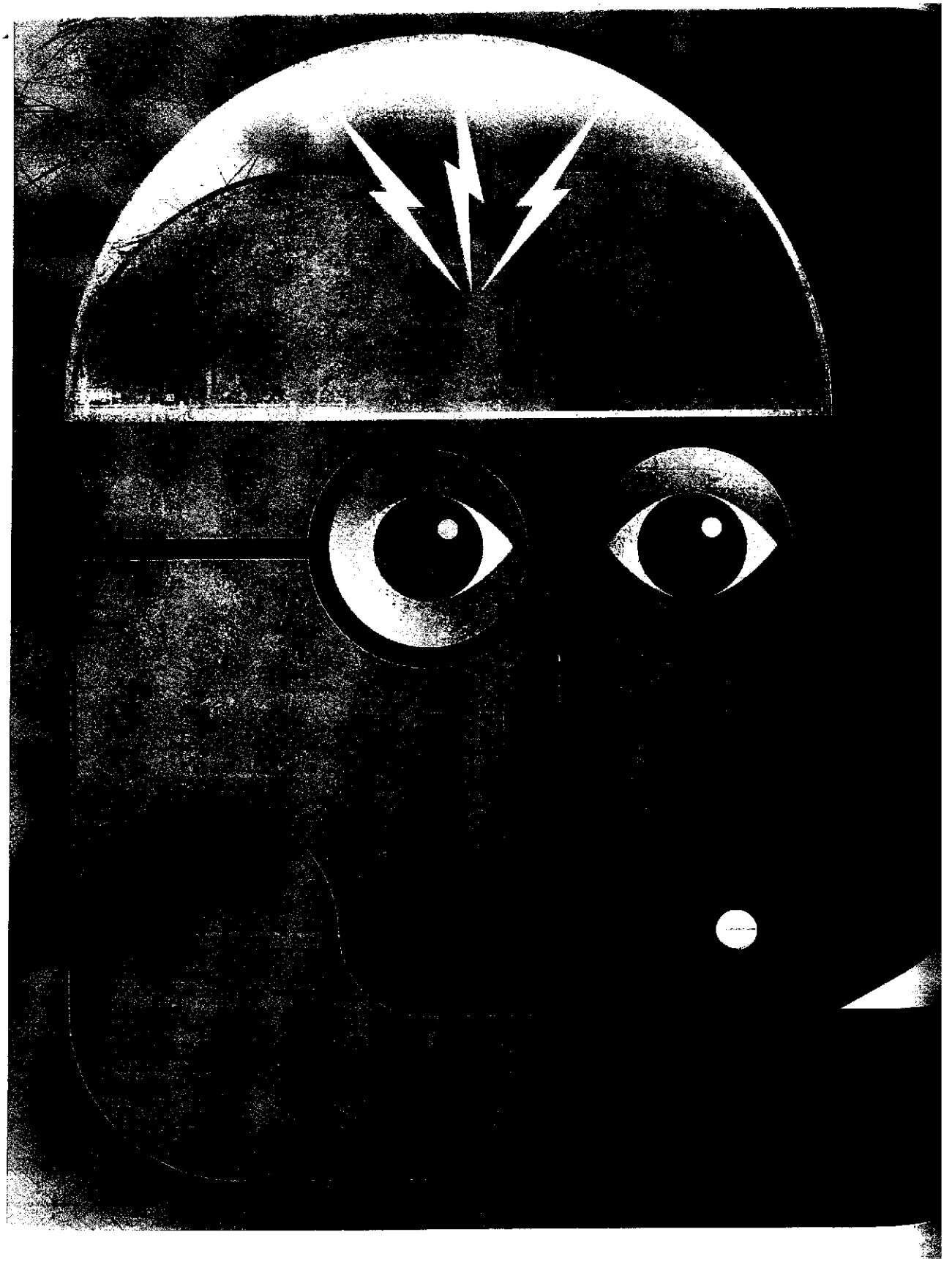


BILINGUAL POWER

THE BENEFITS OF LEARNING A SECOND LANGUAGE—AS SENIOR EDITOR MARY STONE FOUND OUT—GO WAY BEYOND BEING ABLE TO COMMUNICATE IN OTHER CULTURES.

BY MARY STONE

KNOWING A SECOND LANGUAGE IS LIKE HAVING A SECRET ENTRANCE INTO ANOTHER CULTURE. THROUGH IT, A PERSON SEES FIRSTHAND HOW A SOCIETY OPERATES—HOW PEOPLE THINK, SPEAK, BEHAVE, REACT, AND A NEW CONTEXT IN WHICH TO SEE ONE'S SELF.

Yet, the benefits only start there. Through bilingualism, people's understanding of their own language improves, but more importantly, their brains become stronger and more efficient over time. These effects can last a lifetime and serve to significantly delay the onset of dementia.

"Cognitive advantages in spoken language bilingualism have been found in research labs all over the world," explains Dr. Peter Hauser, a deaf clinical neuropsychologist and associate professor in the department of research and teacher education at Rochester Institute of Technology's National Technical Institute for the Deaf. Part of the advantage seems to come from the mental exercise of distinguishing between which language is relevant in any given situation.

Total fluency is not necessary to observe some of these benefits. Yes, some studies do show that higher proficiency in a second language leads to bigger cognitive benefits in old age, explains Dr. Benjamin Zinszer, Ph.D. from the Brain & Cognitive Sciences and Rochester Center for Brain Imaging Office at University of Rochester.

"However, we can observe these changes in brain activity beginning after just a few months of language classes," Zinszer says. "The effects of language proficiency also become less important as a person's level of education increases. In other words, learning new skills and managing difficult cognitive tasks might be the key to unlocking these long-term cognitive benefits in aging, whether through language learning or other types of educational pursuits."

The benefits come from managing the languages: In a bilingual person, both languages are on the ready at all times. One language does not go to sleep when another is in use, for example. Subconsciously, the language that is not being spoken must be suppressed every time a person speaks.

Bilinguals in a monolingual environment, RIT's Hauser explains, must constantly shift their attention away and push down the second language not being used. "The shifting and inhibiting have to occur because one cannot process two languages at once as they compete for cognitive space," Hauser states.

This shifting exercise stems from the executive control system. It functions in at least two different regions of the brain. The executive control system makes it possible for you to keep two things in your mind at the same time and switch between them while trying to solve a problem, for example. (It's also responsible for controlling behavior and the ability to form concepts and think abstractly.)

This exercise occurs in every conversation. It's one reason why research shows that bilinguals do have to search for their words more often than monolinguals. They have a slower "lexical processing speed," but that disadvantage is offset by stronger cognitive functioning. When bilinguals search for a word, it's usually because the wrong language, at that moment, has been suppressed. But it doesn't matter since, even when a bilingual chooses the wrong word, the brain is still benefiting from the exercise.

"It happens to me all the time," explains Dr. Maria Stella Plutino Calabrese, an assistant professor of Spanish at St. John Fisher College. Calabrese speaks three languages. But sometimes the wrong language emerges, she says. "I have to search for words when I'm tired, or when I'm very excited. When I'm excited, I don't want to waste time over the course of conversation looking for the right word so I let the wrong word escape. I will explain what the word means, whether it's Italian or Spanish or English, and then the right word eventually will come to me. This happens sometimes in class. My students are used to it. They get the benefit of learning a new word in another language."

An improved understanding or awareness of grammar in one's native language is another common advantage from learning a second language. It can be observed in bilinguals as young as 5 or 6 years old. Compared to their monolingual peers, bilinguals have better "metalinguistic awareness," which is the ability to recognize language as a system that can be explored and configured.

A world-renowned expert in cognitive science and bilingualism, Dr. Ellen Bialystok of York University in Toronto found that when bilingual children are asked a question that makes no sense, the answer is usually very different from their monolingual counterparts. Bialystok asked children if the sentence "Apples grow on noses" is grammatically correct. The monolingual children could not answer the question. They would say, "That's silly," and stall, without giving an answer. Bilingual children, by contrast, would say: "That's silly, but it's grammatically correct."

That answer, Bialystok explained, is an example of how, overall, bilinguals are better at resolving the occasional conflict between form and meaning a strength stemming from the executive control system, which Bialystok describes as the brain's general manager. Because bilinguals get a workout every time they speak, they become better than monolinguals at switching tasks, at prioritizing information in confusing situations. They are better at ignoring distractions and focusing their attention.

Over time, the repetition of selecting and suppressing eventually changes the architecture of the brain. "Learning a new language seems to result in changes to gray matter—neurons—and new or stronger connections between neurons," Zinszer says. (Gray matter includes areas of the brain involved in muscle control, seeing, hearing, memory, emotions, speech, decision making, and self-control.)

"I think the most interesting aspect of bilingualism is just how profound the differences can be between languages and how bilinguals still manage these differences to successfully communicate in two or more languages," Zinszer says. His research focuses specifically on the interaction between different languages. "For example, I'm very interested in how bilinguals describe common objects like cups and bottles," Zinszer says. "Our research shows that this task is surprisingly demanding for the bilingual brain because languages don't just have their own names for

objects, but different languages often disagree on what categories an object belongs in: Am I drinking my coffee from a cup, a mug, or a Thermos?"

The best name for a common object isn't always obvious, he says. "Bilinguals have about twice as many different words competing at the same time for any object that they want to describe," Zinszer says. "If constantly choosing between two languages gives bilinguals a beneficial cognitive workout, imagine what it's like choosing between the many different words for a coffee cup in two languages at the same time."

Interestingly, the same increase in gray matter speaking bilinguals show does not show up in bilinguals who use American Sign Language. Researchers conclude that it is managing two spoken languages in the same modality that leads to the increase in gray matter, not simply having a larger vocabulary.

...WE CAN OBSERVE THESE CHANGES IN BRAIN ACTIVITY BEGINNING AFTER JUST A FEW MONTHS OF LANGUAGE CLASSES."

RIT's Hauser agrees: "However, there are other cognitive advantages to learning sign language," Hauser notes. "Deaf and hearing individuals who learn a sign language generate images in their head faster, have better spatial memory, and have better visual working memory than those who do not know how to sign," Hauser explains. "At RIT, we are currently doing a longitudinal study on the cognitive advantages of learning American Sign Language as a second language."

ASL is the third most frequent modern language taught in US colleges and universities, Hauser adds. At RIT, over 1,000 students take ASL courses each year.

In the first half of the 20th century, however, bilingualism was believed to be a cognitive disadvantage, due in part to pervasive xenophobia. Brain imaging technology and other advances, especially over the last 20 years, have shown the opposite is true. Learning another language can improve our internal wiring, and make us not smarter, but better learners.

The effects of bilingualism on the brain continue across a bilingual's lifespan.

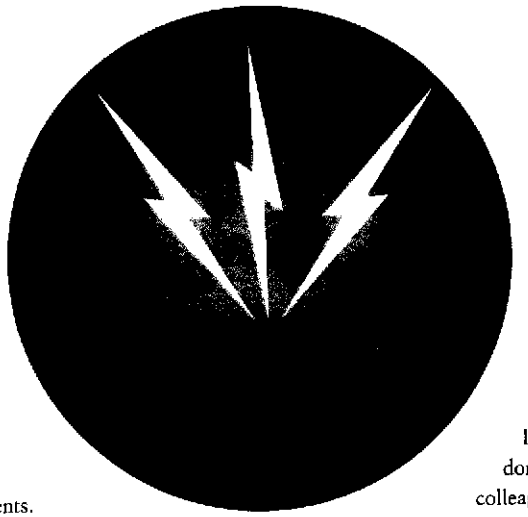
In her research, York University's Bialystok did two kinds of studies; the first was done in 2004. It found that normally aging bilinguals had better cognitive functioning than normally aging monolinguals, doing especially better on executive control tasks (which range from basic skills such as attention, memory, and motor skills to higher-level skills, such as the ability to control, plan, and change behavior as needed).

Those findings led Bialystok and her team to look at subjects who didn't have normal cognitive function. They looked at the medical records of 400 Alzheimer's patients. On average, the bilinguals showed Alzheimer's symptoms five or six years later than those who spoke only one language. This, Bialystok explained, means that bilinguals can cope with the disease for longer and continue to function at a higher level than monolingual Alzheimer's patients at the same stage of disease.

It didn't mean that the bilinguals didn't have Alzheimer's. It meant that as the disease developed in the brain, they were able to continue functioning at a higher level, longer.

So, bilinguals maintain better cognitive function whether or not they get dementia.

But beyond the cognitive and neurological benefits, beyond the processing, reasoning, and other improvements in brain function, there are personal benefits: the ability to explore a place and culture through the native language and get to know the people in a way that is impossible



otherwise, Calabrese says. "It's a way to enrich yourself, to get to know yourself. The best thing I ever did was to learn more than one language."

Yet, many Americans are afraid to speak a second language, she says. She sees it in her American friends and family but also her students. "They are afraid of exposing themselves, of being made fun of. I think it's due in part to a perfectionism in American culture. You are judged by what you do, what you accomplish."

Daring to speak a foreign language can be as daunting as the process of learning it. Some studies suggest that people for whom learning a new language comes more easily might be benefiting from a neural connection pathway that others of us lack. Calabrese says that people who come from households where other languages were spoken often are more pliable when it comes to adopting a new language. It's also less intimidating to learn. Students from science and math backgrounds are also at an advantage, she says. "There are a lot of rules in language just like science and mathematics. There's the rule and the exception to the rule. It's a system they already know how to apply."

But for those who struggle with learning a new language, a certain anxiety permeates every conversation.

Author Eva Hoffman, a Polish-English bilingual, describes the frustration of speaking a second language in her book "Lost in Translation."

"... it takes all my will to impose any control on the words that emerge from me. I have to form entire sentences before uttering them; otherwise, I too easily get lost in the middle. My speech, I sense, sounds monotonous, deliberate, heavy—an aural mask that doesn't become or express me at all. ..."

It's called foreign language anxiety, and it involves the fear of making a silly mistake, of stumbling through a conversation. Sufferers don't want to sound stupid; they fear being laughed at.

Dr. Aneta Pavlenko, a research professor of applied linguistics at the Center for Multilingualism at the University of Oslo, compares learning a foreign language to dating. Speaking another language, she says, is like finding yourself tongue-tied, terrified of making a mistake or seeming foolish in front of the object of your affection.

To understand the effects of anxiety on language learning and use, University of London professor Dr. Jean-Marc Dewaele and his colleagues analyzed responses to foreign language anxiety questionnaires. The results showed that there are a few groups that are particularly affected by "foreign language fright," including girls, perfectionists, and introverts.

Girls reported experiencing foreign language anxiety more intensely than boys. Perfectionists were found to set impossibly high standards and then feel debilitating anxieties, leading them to procrastinate and avoid studying.

Highly anxious language learners, the study found, generally underestimate their language competence, while other students, usually extroverts, tend to overestimate their competence. They speak and interact far more easily—and more often.

Research findings also show that some types of foreign language communication are more anxiety-inducing than others. Talking on the phone or speaking with strangers stirs more worries than talking in that same language with friends.

To overcome the perfectionism and social anxiety is hard though. But the near- and long-term cognitive benefits, not to mention the personal enrichment and depth of experience, make learning a second language a challenge worth assuming.

"Some of our ongoing research suggests that the same areas of the brain that are managing the competition between two languages also become more active with each new name for an object that a person knows," Zinszer says. "When you think about all the different words you know for everyday objects, it seems that bilinguals must have quite a lot of information to manage, even for simple tasks like ordering in a cafe.

"In that light, it's not difficult to see how speaking two languages keeps the brain very active."